

REMARKS/ARGUMENTS

Claims 23-26 have been canceled. Claims 12-24 and new Claims 27-37 are active in the case. Reconsideration is respectfully requested.

The present invention relates to a thermoplastic polyurethane.

Claim Amendments

Claim 12 has been amended to recite that the high molecular weight diol component is a mixture or combination of a polyether diol and a polysiloxane diol, wherein the polysiloxane diol is an ester-modified polysiloxane diol that is obtained by copolymerizing an alkyl-alcohol-modified siloxane with ϵ -caprolactone. Support for this limitation can be found in Examples 5 and 10 of the text of the specification on pages 18 and 23. Pages 18 and 23 at the bottom of each shows a specific alkyl-alcohol-modified siloxane oil. The formula on each page shows a $C_2H_4C_3H_6$ group on each terminus of the oil, as well as terminal OH groups. The alkylene groups are believed to be sufficient to support the term "alkyl" in Claim 12, while the hydroxyl groups are believed sufficient to support the term "OH."

Examples 5 and 10 also support new Claim 27, while support for new Claims 28 and 29 is provided by active Claims 20 and 21.

New Claims 30-33 are the same subject matter of canceled Claims 23-26, and new Claims 34-37 are of the same line of claimed subject matter as Claims 23-26. Entry of the amendments and new claims into the text is respectfully requested.

Invention

As claimed in Claim 12 the present invention is directed to a thermoplastic polyurethane comprising a segment A formed of a high molecular weight diol, a segment B formed of a low molecular weight diol, and a segment C formed of a polyisocyanate. The

segments A, B and C are bonded together in a linear form by urethane bonds. The high molecular weight diol is a mixture of a polyether diol and a polysiloxane diol, with each diol having a number average molecular weight ranging from 1,000 to 10,000. As now newly claimed, the polysiloxane diol is an ester-modified polysiloxane diol that is obtained by copolymerizing an alkyl-alcohol-modified siloxane with ϵ -caprolactone. The high molecular weight diol, the low molecular weight diol and the polyisocyanate are used in proportions of 100 parts by weight, from 10 to 120 parts by weight and from 20 to 170 parts by weight, respectively. The thermoplastic polyurethane has an impact resilience at 23°C ranging from 50 to 90 % and also has an impact resilience at 0°C of at least 0.6 times of its impact resilience at 23°C.

The importance of the ester-modified polysiloxane diol component of the high molecular weight diol component is demonstrated by the data in Tables 1 and 2 with respect to Examples 5 and 10, because it is these two examples that employ the specific copolymerized alkyl-alcohol-modified siloxane reacted with ϵ -caprolactone component. The examples show that the thermoplastic polyurethanes that result exhibit excellent properties that are typified by high impact resistance at 0° C (63.1 % and 62.7 %) and high 0° C/23° C impact resilience ratios of 0.80 and 0.82.

Prior Art Rejection

Claims 12-26 stand rejected based on 35 USC 102(e) as anticipated by Wu et al, U. S. Patent 6,861,492. This ground of rejection is respectfully traversed.

The Wu et al patent discloses a golf ball core and a cover where the core or the cover is comprised of a thermoplastic or thermosetting material that is the reaction product of a siloxane polyol and an isocyanate. However, the reference does not describe an ester-

modified polysiloxane as a polysiloxane diol for reaction with a polyisocyanate to form the golf ball cover or core. Thus, the reference does not anticipate the invention as claimed.

It is further noted that the filing date of the patent of April 4, 2003 is antedated by the filing date of January 27, 2003 of each of the two Japanese priority dates of the present case. Withdrawal of the anticipatory ground of rejection is respectfully requested.

Claims 12-14 and 16-20 stand rejected based on 35 USC 102(b) as anticipated by Harris et al, U. S. Patent Publication 2003/0078341 and Ward 4,675,361. This ground of rejection is respectfully traversed.

The Harris et al patent discloses golf ball covers and cores that are formed from polycarbonate-urethane elastomers, and the Ward patent discloses a polymer admixture from a base polymer and a thermoplastic copolymer, wherein a preferred embodiment has soft blocks of non-polar polydialkylsiloxanes. However, neither reference teaches or suggests an ester-modified polysiloxane as a polysiloxane diol for reaction with a polyisocyanate to form the urethane product of either reference, and therefore the invention as claimed is not anticipated and the anticipatory ground of rejection should be withdrawn.

Claims 15 and 21-26 stand rejected based on 35 USC 103(a) as obvious over Harris et al, U. S. Patent Publication 2003/0078341 in view of Wu et al, U. S. Patent 6,486,261. This ground of rejection is respectfully traversed.

Applicants traverse the rejection above for the same reason as in the other grounds of rejection in that neither of the references teaches or suggests the specific polysiloxane diol derivative of the present claims which is an ester-modified polysiloxane as a polysiloxane diol for reaction with a polyisocyanate to form a urethane product. Yet, as seen from the discussion above, it is the presence of the polysiloxane diol in the high molecular weight diol that gives rise to a polyurethane product of outstanding physical properties. Accordingly, withdrawal of the rejection is respectfully requested.

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It is believed that the application is in proper condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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A handwritten signature in cursive script, reading "F D Vastine", written in dark ink.

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